IN THE CLAIMS

1. (Cancelled)

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Currently Amended) A method of fabricating a semiconductor device having a ferroelectric capacitor, comprising the steps of:

forming an active device element on a substrate;

forming an insulation film over said substrate to cover said active device element;

forming a lower electrode layer of said ferroelectric capacitor over said insulation film, such that said lower electrode is formed on a layer containing Ti;

forming a ferroelectric film on said lower electrode as a capacitor insulation film of said ferroelectric capacitor;

crystallizing said ferroelectric film by applying a thermal annealing process in an O_2 atmosphere under a reduced total pressure in the range between 1 Torr and 40 Torr such that peeling of the ferroelectric film is substantially reduced; and

forming an upper electrode layer on said ferroelectric film.

13. (Cancelled)

14. (Currently Amended) A method of fabricating a semiconductor device having a ferroelectric capacitor, comprising the steps of:

forming an active device element on a substrate;

forming an insulation film over said substrate to cover said active device element;

forming a lower electrode layer of said ferroelectric capacitor over said insulation film, said lower electrode layer being formed on a layer containing Ti atoms;

forming a ferroelectric film on said lower electrode layer as a capacitor insulation film of said ferroelectric capacitor;

crystallizing said ferroelectric film by applying a thermal annealing process in an atmosphere [[of]] containing an inert gas and an oxidizing gas with a fraction of 1 to 20% in volume; and

forming an upper electrode layer on said ferroelectric film, wherein said step of crystallizing said ferroelectric film is conducted by supplying O_2 controlled to cause an oxidation in said Ti atoms that have reached a surface of said lower electrode from said layer part containing Ti atoms.

15. (Currently Amended) A semiconductor device, comprising:

a substrate;

an active device element formed on said substrate;

an insulation film provided over said substrate to cover said active device element;

a lower electrode containing Pt provided over said insulation film;

a PZT ferroelectric film provided on said lower electrode, said PZT ferroelectric film having a columnar microstructure extending from an interface between said lower electrode and said PZT ferroelectric film in a direction substantially perpendicular to a principal surface of said lower electrode, said PZT ferroelectric film generally having a <111> orientation extending continuously from a bottom surface of said PZT ferroelectric film to a top surface of said PZT ferroelectric film and consisting of crystal grains generally having said <111> orientation and a substantially uniform grain diameter of less than about 200nm; and

an upper electrode provided on said PZT ferroelectric film.

16. (Previously Presented) A semiconductor device as claimed in claim 15, wherein said crystal grains constituting said PZT ferroelectric film have an average diameter of about 150 nm.

17. (Original) A semiconductor device as claimed in claim 15, wherein said lower electrode comprises a Ti layer and a conductor layer provided further on said Ti layer.

18. (Original) A semiconductor device as claimed in claim 17, wherein said conductor layer is formed of Pt.

19. (Previously Presented) A semiconductor device as claimed in claim 17, wherein said PZT ferroelectric film has a perovskite structure.

20. (Cancelled)

21. (Currently Amended) A method of fabricating a semiconductor device having a ferroelectric capacitor, comprising the steps of:

forming an active device element on a substrate;

forming an insulation film over said substrate to cover said active device element;

forming a lower electrode layer of said ferroelectric capacitor over said insulation film such that said lower electrode is formed on a layer containing Ti;

forming an amorphous PZT ferroelectric film on said lower electrode layer as a capacitor insulation film of said ferroelectric capacitor in the form of an amorphous film;

crystallizing said amorphous PZT ferroelectric film by applying a thermal annealing process in an atmosphere containing a non-oxidizing gas and an oxidizing gas; and

forming an upper electrode layer on said PZT ferroelectric film, wherein said step of crystallizing said PZT ferroelectric film is conducted by setting the composition of said atmosphere such that said atmosphere contains said oxidizing gas with a fraction of 1 - 20% by volume, and wherein said method further comprises the step, after said step of crystallizing said PZT ferroelectric film, of oxidizing said ferroelectric film in an oxidizing atmosphere such that the

density of pinholes formed in said ferroelectric film in said crystallizing step is reduced.

22. (Previously Presented) A method as claimed in claim 21, wherein said step of forming said lower electrode layer includes depositing a Ti layer and a Pt layer consecutively.

23. (Previously Presented) A method as claimed in claim 21, wherein said non-oxidizing gas is selected from a group consisting of Ar, He, Ne, Xe and N2.

24. (Previously Presented) A method as claimed in claim 21, wherein said oxidizing gas is selected from a group consisting of O2, N2O, NO and NO2.

25. (Previously Presented) A method as claimed in claim 21, wherein said step of crystallizing said ferroelectric film is conducted by a rapid thermal annealing process.

26. (Previously Presented) A method as claimed in claim 21, wherein said step of forming said ferroelectric film comprises the step of forming said ferroelectric film by a sputtering process.

27. (Previously Presented) A method as claimed in claim 26, wherein said ferroelectric film has a perovskite structure.

28. (Previously Presented) A method as claimed in claim 27, wherein said ferroelectric film is a film of zirconate titanate of Pb.